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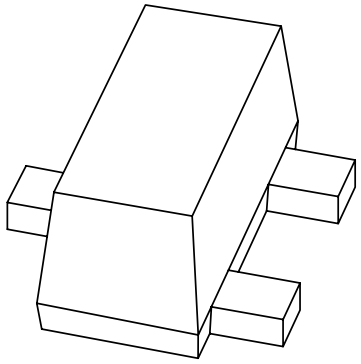
# DATA SHEET



# PBSS3540F

## 40 V low $V_{CEsat}$ PNP transistor

Product specification

2001 Jul 13

Philips
Semiconductors

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# 40 V low $V_{CEsat}$ PNP transistor PBSS3540F

## FEATURES

- Low collector-emitter saturation voltage
- High current capability
- Improved thermal behaviour due to flat leads
- Enhanced performance over SOT23 general purpose transistors.

## APPLICATIONS

- General purpose switching and muting
- Low frequency driver circuits
- Audio frequency general purpose applications
- Battery driven equipment (mobile phones, video cameras, hand-held devices).

## DESCRIPTION

PNP low $V_{CEsat}$ transistor in a SC-89 (SOT490) plastic package.
NPN complement: PBSS2540F.

## MARKING

| TYPE NUMBER | MARKING CODE |
|---|---|
| PBSS3540F | 2D |

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|---|---|---|---|
| $V_{CEO}$ | collector-emitter voltage | –40 | V |
| $I_{CM}$ | peak collector current | –1 | A |
| $R_{CEsat}$ | equivalent on-resistance | <700 | mΩ |

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | base |
| 2 | emitter |
| 3 | collector |

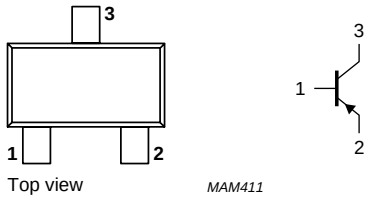



Fig.1 Simplified outline (SC-89; SOT490) and symbol.

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | – | –40 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | –40 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | –6 | V |
| $I_C$ | collector current (DC) | | – | –500 | mA |
| $I_{CM}$ | peak collector current | | – | –1 | A |
| $I_{BM}$ | peak base current | | – | –100 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C | – | 250 | mW |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | | –65 | +150 | °C |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | in free air | 500 | K/W |

## CHARACTERISTICS

$T_{amb}$ = 25 °C unless otherwise specified.

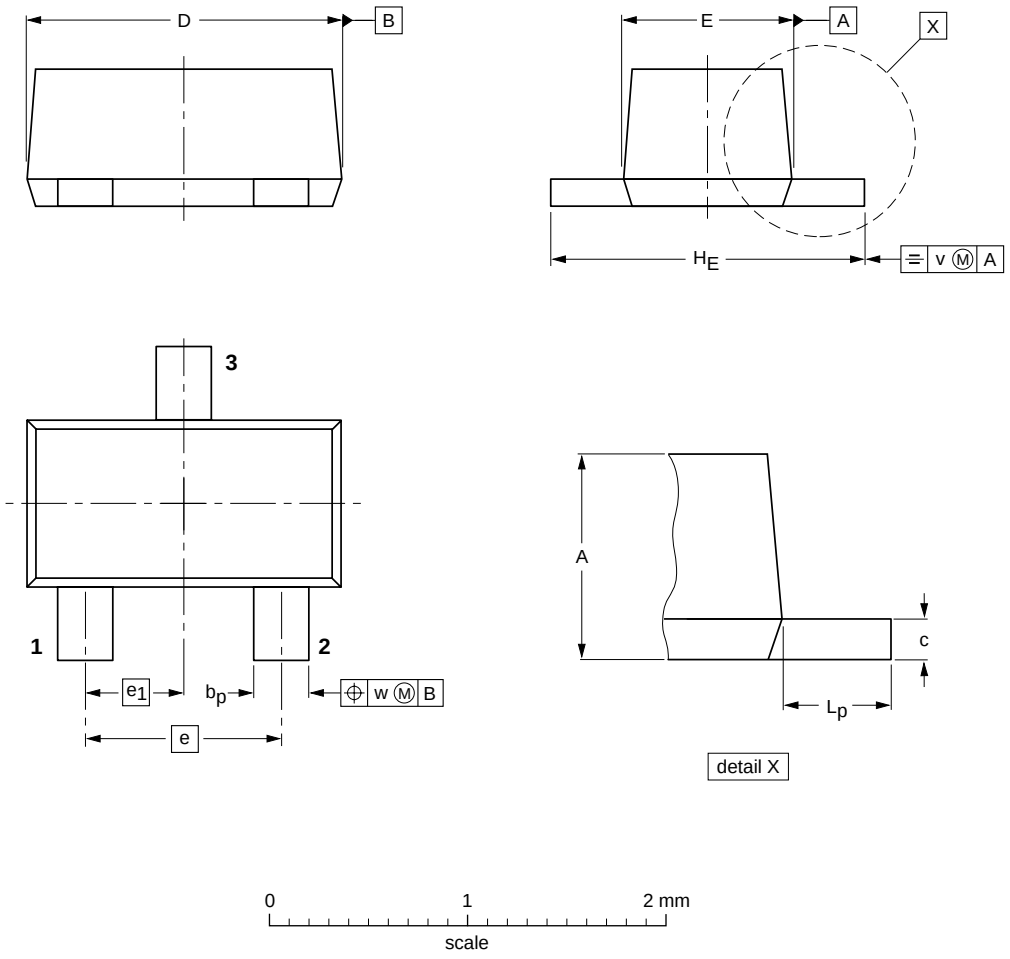
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | collector-base cut-off current | $V_{CB}$ = –40 V; $I_E$ = 0 | – | – | –100 | nA |
| | | $V_{CB}$ = –40 V; $I_E$ = 0; $T_j$ = 150 °C | – | – | –50 | µA |
| $I_{BEO}$ | emitter-base cut-off current | $V_{EB}$ = –5 V; $I_C$ = 0 | – | – | –100 | nA |
| $h_{FE}$ | DC current gain | $V_{CE}$ = –2 V | | | | |
| | | $I_C$ = –10 mA | 200 | – | – | |
| | | $I_C$ = –100 mA; note 1 | 150 | – | – | |
| | | $I_C$ = –500 mA; note 1 | 40 | – | – | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = –10 mA; $I_B$ = –0.5 mA | – | – | –50 | mV |
| | | $I_C$ = –100 mA; $I_B$ = –5 mA | – | – | –130 | mV |
| | | $I_C$ = –200 mA; $I_B$ = –10 mA | – | – | –200 | mV |
| | | $I_C$ = –500 A; $I_B$ = –50 mA; note 1 | – | – | –350 | mV |
| $R_{CEsat}$ | equivalent on-resistance | $I_C$ = –500 mA; $I_B$ = –50 mA; note 1 | – | 440 | <700 | mΩ |
| $V_{BEsat}$ | base-emitter saturation voltage | $I_C$ = –500 mA; $I_B$ = –50 mA; note 1 | – | – | –1.2 | V |
| $V_{BEon}$ | base-emitter turn-on voltage | $V_{CE}$ = –2 V; $I_C$ = –100 mA; note 1 | – | – | –1.1 | V |
| $C_c$ | collector capacitance | $V_{CB}$ = –10 V; $I_E$ = $I_e$ = 0; f = 1 MHz | – | – | 10 | pF |
| $f_T$ | transition frequency | $I_C$ = –100 mA; $V_{CE}$ = –5 V; f = 100 MHz | 100 | 300 | – | MHz |

**Note**

1. Pulse test: $t_p \leq 300$ ms; $\delta \leq 0.02$.

**PACKAGE OUTLINE**

**Plastic surface mounted package; 3 leads** **SOT490**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $b_p$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | v | w |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 0.8<br>0.6 | 0.33<br>0.23 | 0.2<br>0.1 | 1.7<br>1.5 | 0.95<br>0.75 | 1.0 | 0.5 | 1.7<br>1.5 | 0.5<br>0.3 | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT490 | | | SC-89 | | | 98-10-23 |

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